IN THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A method for encrypting programs for encrypted execution on a computer network having a remote host computer, comprising the steps of:

~~encoding~~encrypting a program as a unitary matrix with n rows and n columns;

~~encoding~~encrypting an input data string to the program as a vector of length n, wherein execution of the program on the input data string is realized by matrix multiplication of the unitary matrix with the vector;

loading the ~~encoded~~encrypted program and the ~~encoded~~encrypted data string on the host computer;

executing the ~~encoded~~encrypted, using the ~~encoded~~encrypted data string, on the host computer;

communicating results from the host computer to the network; and

decoding the results into output representative of executing the encrypted program with the ~~encoded~~encrypted data string, wherein computations and data associated with the program and data string are unintelligible and useless at the host computer.

2. (Currently Amended) A method of claim 1, wherein the step of ~~encoding~~encrypting a program comprises converting the program to a unitary matrix multiplication.

3. (Original) A method of claim 2, wherein the step of converting the program comprises converting the program to a unitary matrix multiplication U such that $U \in U_n$ for some integer n, where U_n represents a group of unitary matrices of size n.

4. (Currently Amended) A method of claim 3, wherein the step of ~~encoding~~encrypting the program comprises generating two independent identically distributed unitary matrices X, Y from the uniform probability distribution over U_n determined by the Haar distribution.

5. (Currently Amended) A method of claim 4, wherein the step of ~~encoding~~encrypting a program comprises the steps of computing U' as XUY* and communicating U' to the remote host computer over the network.

6. (Currently Amended) A method of claim 4, wherein the step of ~~encoding~~encrypting the input data string comprises converting the input data string to a vector b.

7. (Currently Amended) A method of claim 6, wherein the step of ~~encoding~~encrypting comprises the steps of computing b' as Yb and communicating b' to the remote host over the network.

8. (Currently Amended) A method of claim 7, wherein the step of executing the ~~encoded~~encrypted program, using the ~~encoded~~encrypted data string, on the host computer comprises the steps of computing the product of XUY* and Yb and communicating results to the network.

9. (Previously Presented) A method of claim 8, wherein the step of decoding the results into output comprises computing X*XUb, external of the host computer, to determine the multiplication of Ub as desired output of the program, wherein XUY* and Yb is (XUb) and X*XUb is obtained by matrix multiplication X*(XUb).

10. (Original) A method of claim 1, wherein the step of decoding comprises decrypting at a control computer connected to the network and the host computer.

11. (Original) A method of claim 1, wherein the network comprises the Internet.

12. (Original) A method of claim 1, wherein the network comprises a virtual private network.

13. (Original) A method of claim 1, wherein the network comprises a local area network (LAN).

14. (Currently Amended) A method of claim 1, further comprising embedding one or more constants into the input data string or program, prior to ~~encoding~~encrypting, to detect incorrect execution or data tampering.

15. (Currently Amended) A secured computer network for executing encrypted computer programs at a remote host computer without sharing intelligible or otherwise useful program code, computations or data associated with execution, comprising:

a control computer for ~~encoding~~encrypting a program as a unitary matrix with n rows and n columns and for ~~encoding~~encrypting an input data string to the program as a vector of length n, wherein execution of the program on the input data string is realized by matrix multiplication of the unitary matrix with the vector; and

a host computer, in network with the control computer, for loading the ~~encoded~~encrypted program and the ~~encoded~~encrypted data string, the host computer executing the ~~encoded~~encrypted program, using the ~~encoded~~encrypted data string, and communicating results to the control computer for decoding, the host computer having substantially no intelligible or otherwise useful program code, computations or data associated with execution of the ~~encoded~~encrypted program.

16. (Currently Amended) A network of claim 15, wherein the control computer embeds one or more constants into the unitary matrix or data string, wherein the results from the host computer indicate tampering or incorrect execution of the ~~encoded~~encrypted program.